

## CLAIMS

1. An intravascular bi-directional pump which is adapted to be located in the upper aorta, whereby it can assist the left ventricle to eject in the forward direction during systole, so as to off-load the heart, and also pump an adequate amount in the reverse  
5 direction, during diastole, to secure coronary flow.
2. An intravascular bi-directional pump according to claim 1 which is adapted to be placed either in the ascending aorta, just distal to the aortic valve leaflets, or in the upper descending aorta.
3. An intravascular bi-directional pump according to claim 1 or claim 2 which  
10 is adapted to be mounted into a stent.
4. An intravascular bi-directional pump according to any preceding claim in which the pump is a centrifugal pump, a positive displacement pump or an axial flow pump.
5. A method of assisting coronary flow comprising placing a bi-directional  
15 pump in the ascending aorta, just distal to the aortic valve leaflets, or in the descending aorta.
6. A method according to claim 5 in which the pump is inserted from the groin or the lower abdomen, and advanced into the aorta until it reaches the required position.
- 20 7. A method according to claim 5 in which the pump is placed in position by slitting the aorta at a suitable position.
8. A method according to claim 3 in which the pump is mounted onto a stent by means of a releasable attachment mechanism so that the pump can be detached and pulled out of the body should it become faulty.